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09/970,104	10/03/2001	Motohiro Suzuki	SIW-013	1403

959 7590 10/06/2003

LAHIVE & COCKFIELD
28 STATE STREET
BOSTON, MA 02109

EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/970,104

Applicant(s)

SUZUKI ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5,12 and 13 is/are rejected.
- 7) ☒ Claim(s) 2-4, 6 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I (claims 1-7 and newly added 12-13) in Paper No. 7 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 10/03/01 (paper # 3) was considered by the examiner.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 62b. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1, 5 and 12-13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 5 of U.S. Patent No. 6554261.

Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The US patent '261 claims the following (CLAIM 5):

5. A humidifier for a fuel cell system comprising:

a housing;

a plurality of bundles of water permeable hollow fiber membranes provided in the housing, each of the bundles having a large number of the water permeable hollow fiber membranes arranged along a longitudinal direction of the housing, wherein two different gases containing different water contents are supplied, one of the two different gases containing large water contents being passed through an inside the water permeable hollow fiber membranes, while the other gas containing lesser water contents being passed through an outside

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of the water permeable hollow fiber membranes, respectively, to exchange water contents to humidify the gas containing lesser water contents; and
a temperature adjustment means that utilizes cooling water heated by cooling a fuel cell of the fuel cell system to heat and cool one of an exhaust gas dis-

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charged from the fuel cell and introduced to said humidifier and the bundles of the hollow fiber membranes so as to maintain temperature thereof substantially at a temperature of the fuel cell in operation.

* * * * *

As to the specific preamble reciting "for a fuel cell system" and "reactive gas and off-gas flow relationship", it is pointed out that the preamble and limitations refer to intended use. That is, the claim is directed to "a humidifier" per se and the preamble phrase "for a fuel cell" is only a statement of ultimate intended utility.

Further, given that no specific fuel cell structure has been positively claimed, it is also contended that the recited flow relationship of both the reactive gas and the off-gas is an ultimate utility. Thus, since claim 5 of the US patent '261 does encompass supplying two different gas containing different water contents wherein of the two gases is being passes through an inside the water permeable hollow fiber membrane while the other gas containing lesser water contents being passed through an outside of the hollow fiber membranes, it is contended that claim 5 of US patent '261 satisfies the requirement of having both gases i.e. the reactive gas and the off-gas themselves.

It is also noted that the examiner has interpreted that "the liquid exhaust mechanism which exhausts liquid" can be the same "reactive gas exit" itself or "the off-gas exit" as such, because they are able to exhaust liquid which has been generated therethrough. In that, the "reactive gas exit" and/ or "the off-gas exit" are inherently recited by the claim because gas entrances and exits are necessarily required in order to supply and remove the gas from the humidifying unit.

Thus, claim 5 of US patent '261 anticipates the claims of the present application.

7. Claims 1 and 5 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application

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No. 09/764277 (*Patent Application Publication US 2001/0021467*). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The copending application '277 claims the following (CLAIM 1):

1. A humidifier having a plurality of water-permeable hollow fiber membranes placed along the lengthwise direction of a housing accommodated within the housing in which gases each having a different moisture content flow

inside and outside said hollow fiber membranes to carry out moisture exchange whereby the dry air having a low moisture content is humidified, said humidifier comprising a gas inlet which introduce the gas flowing outside the hollow fiber membranes within the housing formed on an end of the lengthwise direction of the housing.

As to the specific preamble reciting "for a fuel cell system" and "reactive gas and off-gas flow relationship", it is pointed out that the preamble and limitations refer to intended use. That is, the claim is directed to "a humidifier" per se and the preamble phrase "for a fuel cell" is only a statement of ultimate intended utility.

Further, given that no specific fuel cell structure has been positively claimed, it is also contended that the recited flow relationship of both the reactive gas and the off-gas is an ultimate utility. Thus, since claim 1 of the copending application '277 does encompass flowing gases each having a different moisture content inside and outside the hollow fiber membrane, it is contended that claim 1 of copending application '277 satisfies the requirement of having both gases i.e. the reactive gas and the off-gas themselves.

It is also noted that the examiner has interpreted that "the liquid exhaust mechanism which exhausts liquid" can be the same "reactive gas exit" itself or "the off-gas exit" as such, because they are able to exhaust liquid which has been generated therethrough. In that, the "reactive gas exit" and/ or "the off-gas exit" are inherently recited by the claim because gas

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entrances and exits are necessarily required in order to supply and remove the gas from the humidifying unit.

Thus, the present claims are anticipated.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

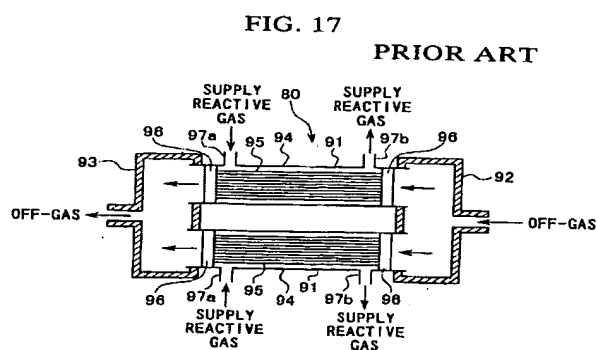
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 and 5 are rejected under 35 U.S.C. 102(a) as being anticipated by applicant's admitted prior art in the US application 09/970104 (*herein after referred to as APA '104*).

The present application is directed to humidifier wherein the disclosed inventive concept comprises the specific liquid exhaust mechanism.

As to claims 1 and 5:

The APA'104 teaches a conventional humidifier for a fuel cell as follows (SECTION 0014-0016/ Figure 17):



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[0014] FIG. 17 shows the humidifier for oxidizing agent 80A and the humidifier for fuel 80B (hereinafter jointly referred to as humidifier 80 unless there is a need to distinguish them). The humidifier 80 comprises a plurality of humidifying units 91, and an entrance head 92 and an exit head 93 which join the humidifying units 91 in parallel. The humidifying units 91 comprise a great number of tube-like porous hollow fiber membranes 95, which are bundled together inside a cylindrical housing 94. The porous hollow fiber membrane is consisted of steam vapor-permeable membranes (water-permeable membranes). Partitioning members 96 tie both ends of the hollow fiber membranes 95, and achieve an airtight seal between the outer surfaces of the hollow fiber membranes 95, and between the outer surfaces of the hollow fiber membranes 95 and the housings 94. One end of the housings 94 is connected to the entrance head 92, and the other end is connected to the exit head 93. Gas entrances 97a and gas exits 97b are provided in the outer peripheral section of the housings 94 further inward from the partitioning members 96. The gas entrances 97a of the housings 94 are connected together via an unillustrated connection path, provided outside the housings 94. Similarly, the gas exits 97b are connected together via an unillustrated connection path, provided outside the housings 94.

[0015] In the humidifier 80, reactive gas is supplied from the gas entrance hole 97a in the housing 94 of each humidifying unit 91, passing between the hollow fiber membranes 95 of the housings 94 and exiting from the gas exit 97b. On the other hand, off-gas is supplied to the entrance head 92, from the entrance head 92 to the housing 94 of the humidifying unit 91 and into the hollow section of the hollow fiber membrane 95, passing through the hollow section and from the other side of the housing 94 into the exit head 93, and exiting from the exit head 93.

[0016] The hollow fiber membranes 95 have countless capillary tube sections running parallel to the diameter;

steam vapor in the off-gas, which is fed into the hollow sections of the hollow fiber membranes 95, condenses in the capillary tube sections and moves to the outer peripheral side, where it is transferred by evaporation to reactive gas. That is, the humidifier 80 transfers the water in the off-gas to the reactive gas, thereby humidifying the reactive gas.

As to the specific preamble reciting “for a fuel cell system” and “reactive gas and off-gas flow relationship”, it is pointed out that the preamble and limitations refer to intended use. That is, the claim is directed to “a humidifier” per se and the preamble phrase “for a fuel cell” is only a statement of ultimate intended utility.

Further, given that no specific fuel cell structure has been positively claimed, it is also contended that the recited flow relationship of both the reactive gas and the off-gas is an ultimate utility. Thus, since the APA '104 does encompass flowing gases each having a different

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moisture content inside and outside the hollow fiber membrane, it is contended that the APA'104 satisfies the requirement of having both gases i.e. the reactive gas and the off-gas themselves.

It is also noted that the examiner has interpreted that "the liquid exhaust mechanism which exhausts liquid" can be the same "reactive gas exit" itself or "the off-gas exit" as such, because they are able to exhaust liquid which has been generated therethrough. In that, the "reactive gas exit" and/ or "the off-gas exit" are inherently recited by the claim because gas entrances and exits are necessarily required in order to supply and remove the gas from the humidifying unit.

Thus, claims 1 and 5 are anticipated.

10. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by applicant's admitted prior art in the US application 09/764277 (*herein after referred to as APA'277*).

As to claims 1 and 5:

The APA'277 teaches a conventional humidifier utilizing a hollow fiber membrane module as follows (SECTION 0003-0006/ Figure 23):

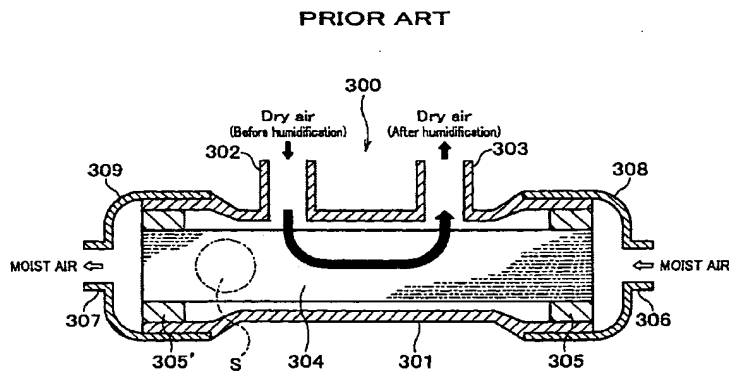
[0003] A conventional humidifier utilizing hollow fiber membranes is disclosed in Japanese Laid-open Patent Publication No. HEI-7-71795. As shown in FIG. 23, a humidifier 300 comprises a housing 301, on which is provided a first inlet 302 for introducing dry air and a first outlet 303 for discharging the dry air (humidified dry air). A bundle of hollow fiber membranes 304 consisting of a number of for example 5000 hollow fiber membranes is accommodated within the housing 301.

[0004] At both ends of the housing 301, fastening members 305, 305' are provided for fixing the ends of the bundle 304 while leaving them open. Outside of the fastening member 305 is provided a second inlet 306 for introducing moist air or moist gas, and a second outlet 307 is provided outside of the fastening member 305' for discharging the moist air, moisture of which is separated and removed at the bundle of hollow fiber membranes 304. The fastening members 305, 305' are covered with a first head cover 308 and a second head cover 309, respectively. And the second inlet 306 is formed on the first head cover 308, while the second outlet 307 is formed on the second head cover 309.

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[0005] In the aforementioned humidifier 300 utilizing hollow fiber membranes, the moist air introduced from the second inlet 306 passes through the hollow fiber membranes forming the bundle of hollow fiber membranes 304, and the moisture within the moist air is separated by capillary action of the hollow fiber membranes. The separated moisture moves outward of the hollow fiber membrane through a capillary tube of the membrane. The moisture-removed air is discharged from the second outlet 307.

[0006] Meanwhile, dry air is supplied from the first inlet 302. The dry air from the first inlet 302 flows outside of the hollow fiber membranes forming the bundle of hollow fiber membranes. Because the moisture separated from the moist air has moved outside of the hollow fiber membranes, the moisture humidifies the dry air. The humidified dry air is then discharged from the first outlet 303.



As to the specific preamble reciting “for a fuel cell system” and “reactive gas and off-gas flow relationship”, it is pointed out that the preamble and limitations refer to intended use. That is, the claim is directed to “a humidifier” per se and the preamble phrase “for a fuel cell” is only a statement of ultimate intended utility.

Further, given that no specific fuel cell structure has been positively claimed, it is also contended that the recited flow relationship of both the reactive gas and the off-gas is an ultimate utility. Thus, since the APA’277 does encompass flowing gases each having a different moisture content inside and outside the hollow fiber membrane, it is contended that the APA’277 satisfies the requirement of having both gases i.e. the reactive gas and the off-gas themselves.

It is also noted that the examiner has interpreted that “the liquid exhaust mechanism which exhausts liquid” can be the same “reactive gas exit” itself or “the off-gas exit” as such,

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because they are able to exhaust liquid which has been generated therethrough. In that, the "reactive gas exit" and/ or "the off-gas exit" are inherently recited by the claim because gas entrances and exits are necessarily required in order to supply and remove the gas from the humidifying unit.

Thus, claims 1 and 5 are anticipated.

Allowable Subject Matter

11. The following is a statement of reasons for the indication of allowable subject matter: a reasonable search for the prior art failed to reveal or fairly suggest what is instantly claimed, particularly: the specific water blockage detecting unit as recited in claim 2; the specific storing unit and supplementary humidification unit as recited in claim 3; and the specific output power detecting unit and controller as recited in claims 4 and 7.

12. Claims 2-4 and 6-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. Claims 12-13 has been rejected under the judicially created doctrine of obviousness-type double patenting

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro
Examiner
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A handwritten signature in black ink, appearing to read 'RAY', with a long horizontal stroke extending to the right.